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TITLE: An adjustable chair

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ABSTRACT:

CHG DATE=19990617 STATUS=O> The chair comprises a base 1, optionally provided with castors 2, carrying pneumatic height adjustment means in the form of a pneumatic piston-and-cylinder arrangement (3). A U-shaped frame member 6 is mounted on one end of the piston 3a, which frame member supports the chair arms 7 at its extremities. The back portion 8 of the chair is hingedly connected to the posterior extremities of these chair arms and the lower region of the back is hingedly connected to the seat portion 10. The seat portion is capable of longitudinal movement due to its mounting on sliding guides 12, 13 mounted on the central portion of the U-shaped frame 6. Accordingly, any change in the angle inclination of the back portion is associated with a corresponding movement of the seat portion so that the centre of gravity of the chair remains substantially stationary. At least a part of the back portion 8 may be resilient. <IMAGE>

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(58) Field of search
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(54) An adjustable chair

(57) The chair comprises a base 1, optionally provided with castors 2, carrying pneumatic height adjustment means in the form of a pneumatic piston-and-cylinder arrangement (3). A U-shaped frame member 6 is mounted on one end of the piston 3a, which frame member supports the chair arms 7 at its extremities. The back portion 8 of the chair is hingedly connected to the posterior extremities of these chair arms and the lower region of the back is hingedly connected to the seat portion 10. The seat portion is capable of longitudinal movement due to its mounting on sliding guides 12, 13 mounted on the central portion of the U-shaped frame 6. Accordingly, any change in the angle inclination of the back portion is associated with a corresponding movement of the seat portion so that the centre of gravity of the chair remains substantially stationary.

At least a part of the back portion 8 may be resilient.

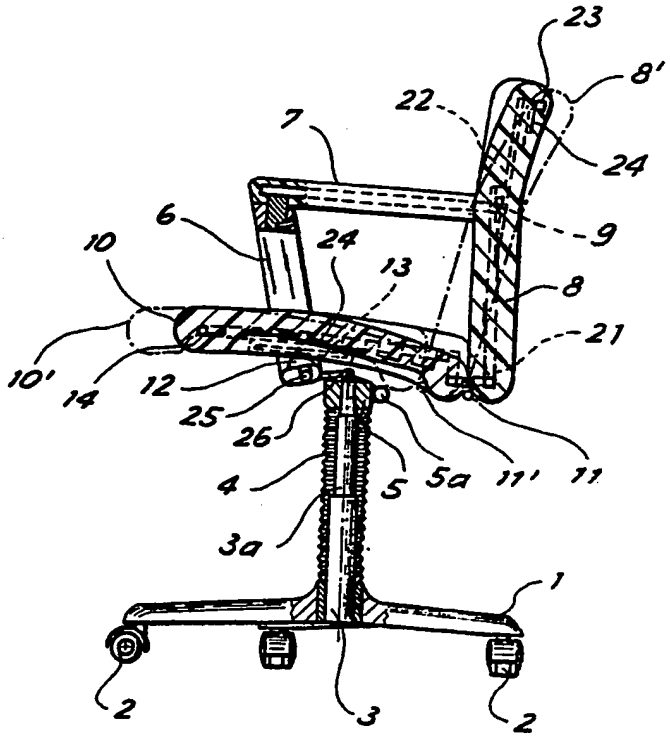

Fig. 2

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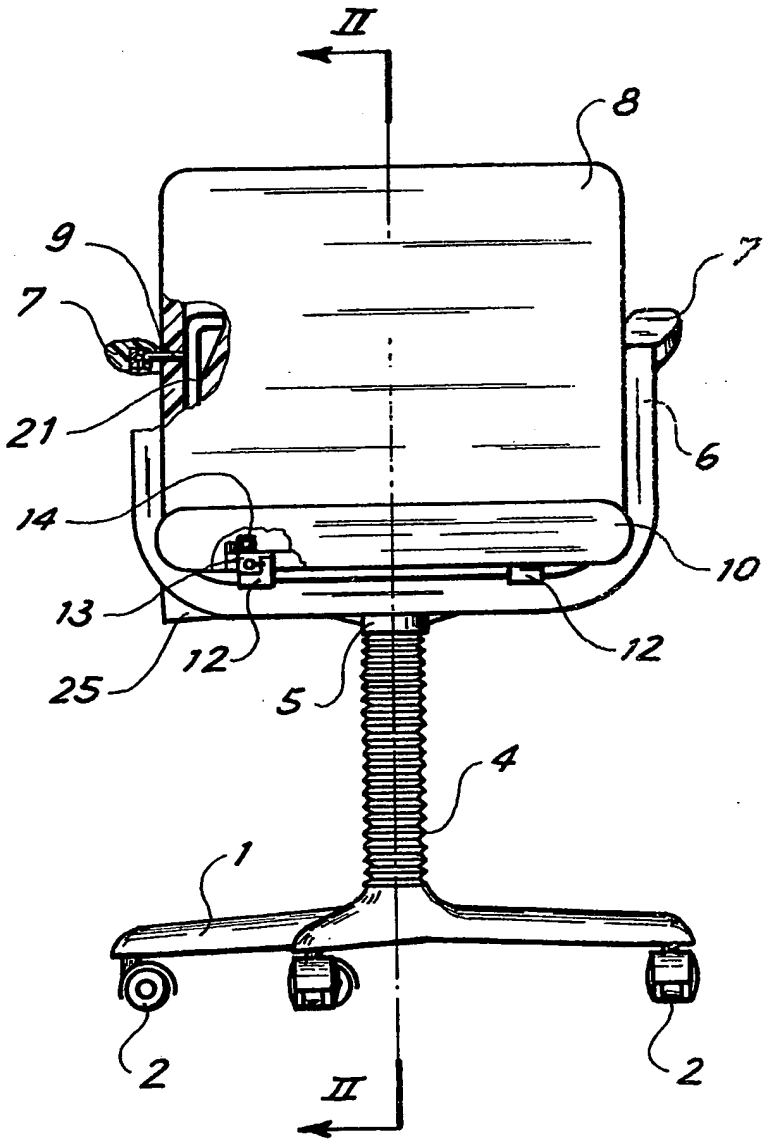

Fig. 1

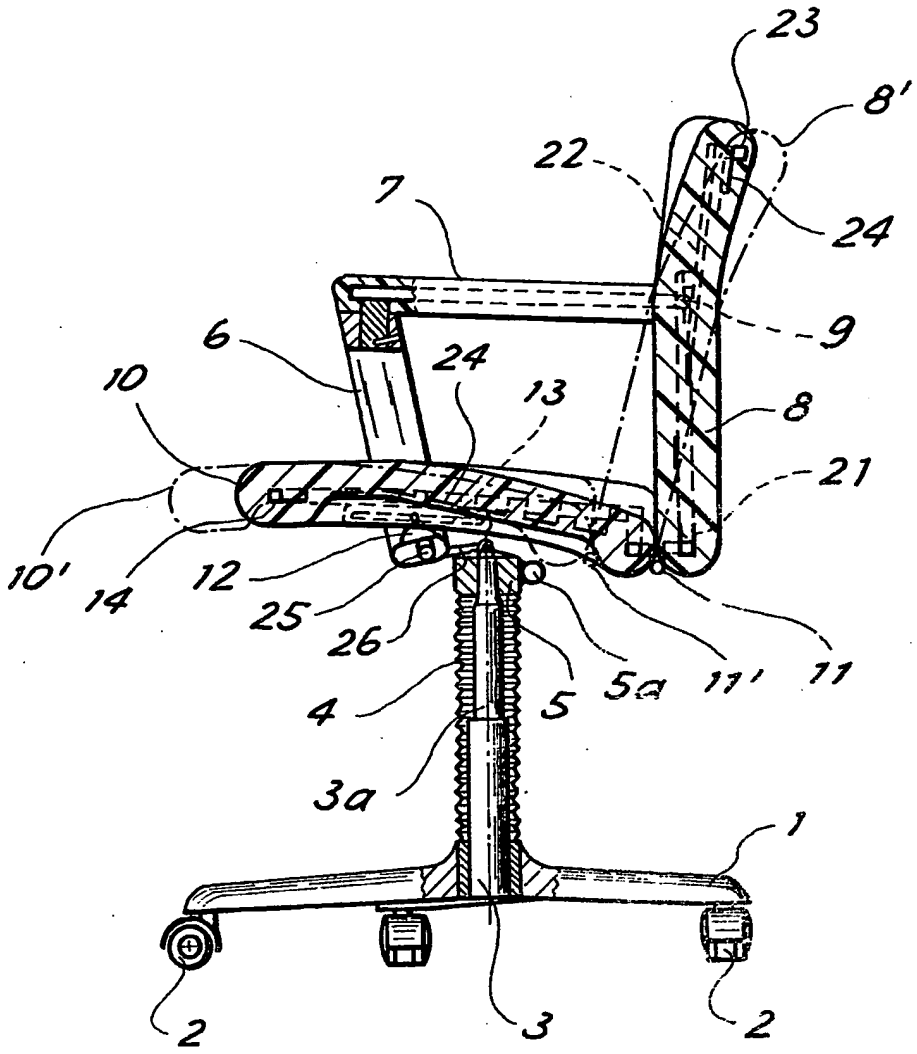

Fig. 2

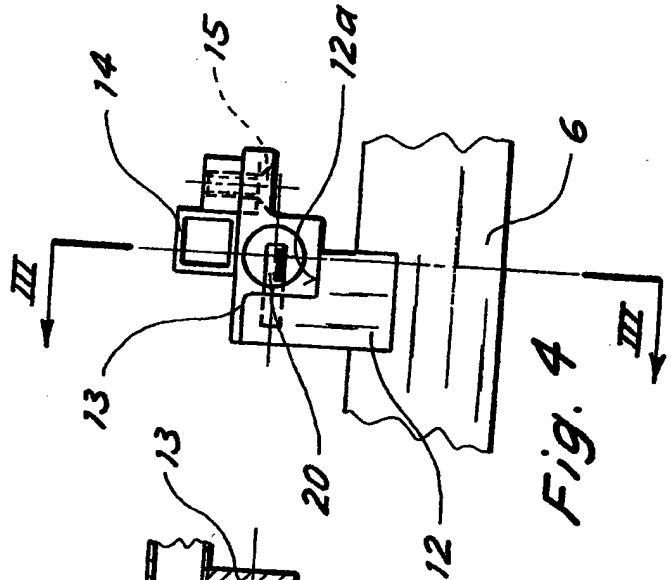

Fig. 4

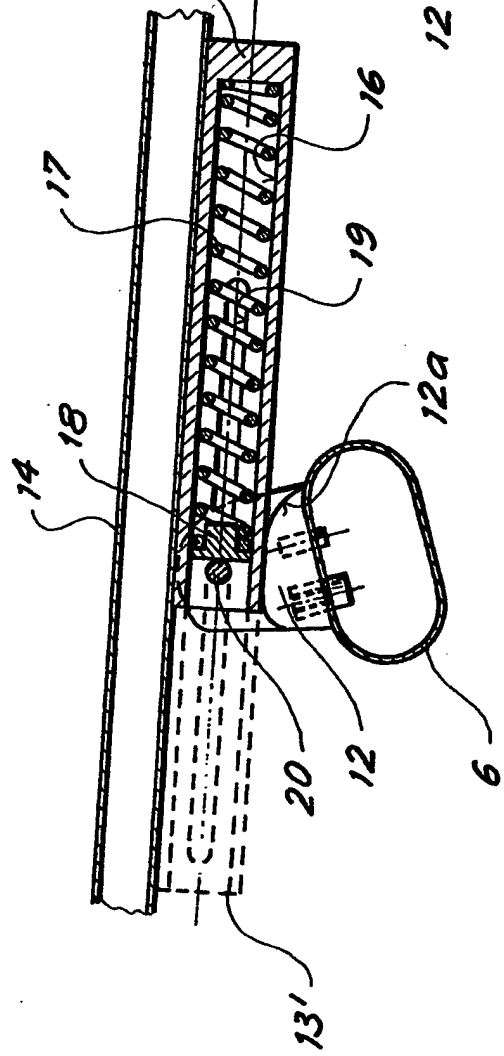

Fig. 3

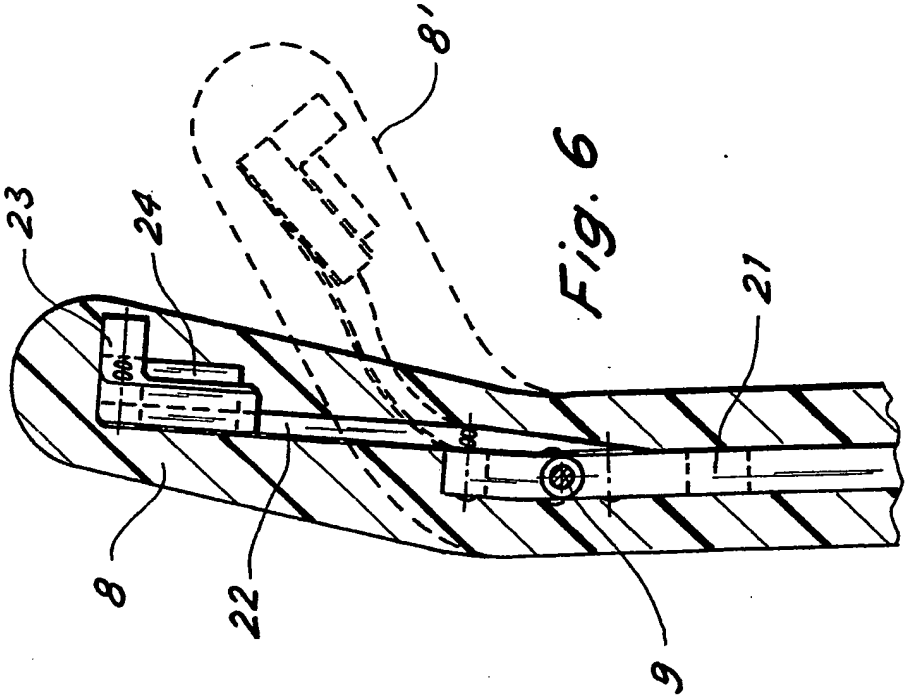

Fig. 6

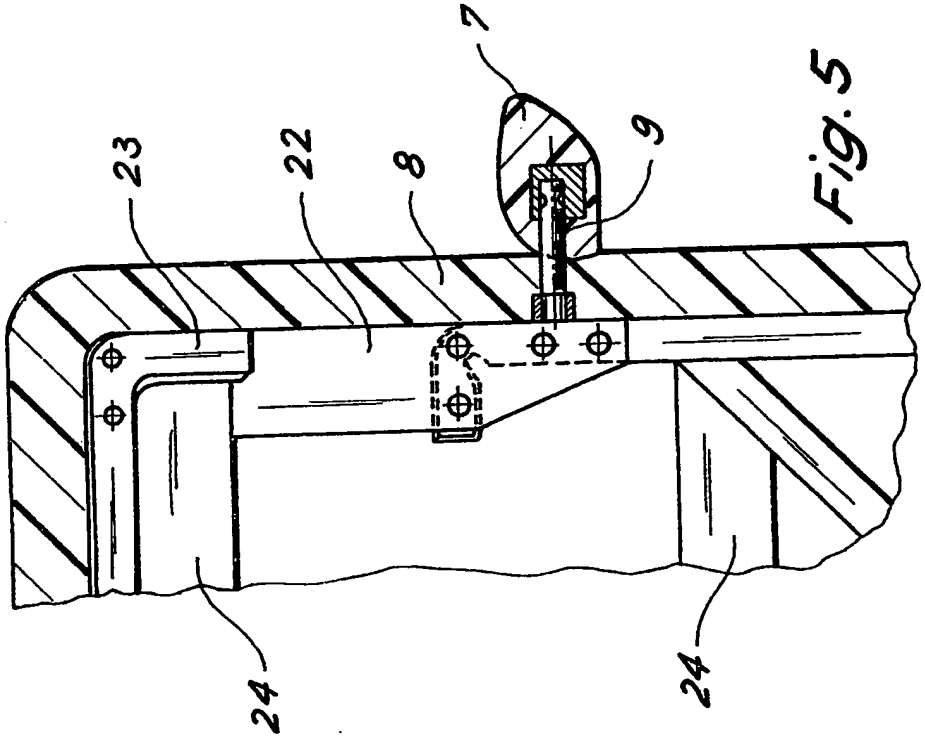

Fig. 5

SPECIFICATION

An adjustable chair

Field of the Invention

The present invention relates to an adjustable chair, more particularly to a chair having both height and backrest adjustments. Primarily, but not essentially, the present invention relates to a chair which is suitable for use in an office.

Objects of the Invention

The present invention seeks to provide a chair having a backrest portion and a seat portion, the positions of which are adjustable in dependence upon the physique of the user and the desired position in which the user wishes to work. To achieve the maximum degree of adjustment, it is necessary for the height of the seat portion to be adjustable and for the back portion and the seat portion to be tiltable. It is also advantageous if the back portion is slightly resilient so as to offer the greatest comfort to the user.

Brief Summary of the Invention

According to the present invention, there is provided an adjustable chair comprising a support base optionally mounted on castors, a pneumatic piston and cylinder arrangement mounted on the base, one end of the piston being connected to a substantially U-shaped structural support member, the upper end of each arm of the support member being fixedly connected to an arm portion of the chair, each arm portion carrying a pivot pin for the rotatable support of a back portion of the chair, the lower region of the back portion being hingedly connected to a seat portion, the seat portion being supported on a pair of sliding guides mounted on the lower connecting portion of the U-shaped support member, and biassing means tending to oppose the movement of the seat portion with respect to the support member so that the position of the centre of gravity remains substantially stationary during movement of the back and seat portions.

Preferably, the sliding guides each comprise two members resting one upon the other, one of the guides being integral with a loadbearing portion of the seat and the other guide being integral with the U-shaped structural support member, the guide member integral with the loadbearing portion comprising an elongate prismatic body having a guide recess formed therein into which a projecting pin portion of the guide member integral with the U-shaped supporting member is inserted, the elongate prismatic member also having a longitudinal recess formed therein in which a spring is located, the pin acting against the spring when the seat portion is pushed forwardly on the guides.

Desirably, the back portion of the chair projects above the connection of the support member to the arms of the chair, the projection portion being resilient and at least one resilient metal sheet being disposed between the lower loadbearing structure and the upper loadbearing structure of the back.

Brief Description of the Drawings

One embodiment of a chair in accordance with the present invention will be further described, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a frontal view of the chair partially in section;

Fig. 2 is a cross-sectional view taken along the line II—II in Fig. 1;

Fig. 3 is a longitudinal cross-sectional view of a detail of the chair shown in Figs. 1 and 2 and corresponds to the cross-section taken along the line III—III in Fig. 4;

Fig. 4 is a front view of the detail shown in Fig. 3;

Fig. 5 is a rear view, partially in cross-section and on an enlarged scale relative to Figs. 1 to 4 of part of the chair; and

Fig. 6 is a side view of the part of the chair shown in Fig. 5.

Description of Preferred Embodiment

As shown in Figs. 1 and 2, a chair according to the present invention comprises a support base 1 mounted on a plurality of castors or wheels 2. The base 1 carries a height adjustment and support device in the form of a pneumatic cylinder and piston unit 3 surrounded by a bellows-type arrangement 4.

One end 3a of the piston of the cylinder and piston unit 3 is attached to a cylindrical member 5. The member 5 has an arcuate support welded thereto on which is carried U-shaped support member 6. The upper extremities of the limbs of the support member 6 are rigidly attached to one end of respective arm members 7. A back portion 8 of the chair is hingedly connected to the free ends of the arm members 7 by means of a pair of pins 9 which rotate between the arms 7. A seat portion 10 of the chair is attached to the lower edge of the back portion 8 by means of a hinge 11.

In its central region, the seat portion 10 also rests on a pair of fixed guides 12, which are attached to the shaped support member 6, through the intermediary of further guide members 13 which are slidably displaceable over the fixed guides 12.

Guides 12 and 13 are shown in greater detail in Figs. 3 and 4. In these Figures, there is shown a portion of the internal tubular structure 14 of the seat portion (generally indicated by the broken line in Fig. 2), which tubular structure 14 has the sliding guide members 13 rigidly connected thereto by means of bolts 15. The sliding guide 13 has internal bore 16 formed therein which receives a spiral spring 17 against which a runner 18 abuts.

The guide 13 also has a recess 19 formed therein in which a pin 20 is slidable. The pin 20 abuts against the runner 18 and is fixedly attached to the fixed guide member 12. This latter is attached to the U-shaped support member 6 and is provided with an inwardly curved profile 12a on which the guide member 13 rests.

It is therefore possible to vary the inclination of back 8 and seat 10 into the positions shown by the dashed lines in Figs. 2 and 3. This is effected by compressing the springs 17 so that sliding guide 13

is moved to position 13' shown in Fig. 3. The pin 20 thus moves to the rearmost extremity of recess 19, that is to say, to the left-hand end as shown in Fig. 3. This causes the back portion 8 to rotate about the pivot pins 9 into the position 8' shown in Fig. 2. Simultaneously, the seat portion 10 slides on the guide members 12 and 13 into the position 10' due to its hinged connection to the back portion 8. The hinge 11 moves into position 11'.

The upper region of the back portion, illustrated in detail in Figs. 5 and 6, comprises a tubular metal structure 21 having two upwardly extending arms, one on each lateral side of the back portion. At the upper end of each arm one of the pins 9 forming a hinge with the arm portions 7 is located. Each arm of the tubular structure carries an extension portion in the form of a resilient web 22, the web 22 carrying an upper connecting cross-piece 23 including a support strip 24.

The upper portion of the back portion of the chair thus automatically adjusts itself in dependence upon the posture of the seated occupant of the chair. The support structures 21 and 14 of the back portion and seat portion respectively are formed from metal tubes and are covered in an expanded plastics material so as to provide the desired external shape and softness. A plurality of support strips 24 extend transversely both across the seat portion and the back portion to provide support in the central regions of each of these two portions of the chair.

The height adjustment device, that is to say, the pneumatic piston and cylinder arrangement 3 is controlled by an operating lever 25 and a linkage 26 and is used to adjust the height of the seat to the requirements of the user.

Accordingly, the back and seat portions of a chair in accordance with the present invention are moved into their desired positions simply by the user applying pressure to the back portion of the chair and by means of a simple height adjustment.

In particular, the forward movement of the seat portion associated with changing the inclination of the back portion ensures that the centre of gravity of the chair and of the user are maintained in a position which is above the central region of the base of the support. This provides great stability and also reduces the bending moments acting on the support structure in any position of use.

CLAIMS

1. An adjustable chair comprising a support base optionally mounted on castors, a pneumatic piston and cylinder arrangement mounted on the base, one end of the piston being connected to a substantially U-shaped structural support member, the upper end of each arm of the support member being fixedly connected to an arm portion of the chair, each arm portion carrying a pivot pin for the rotatable support of a back portion of the chair, the lower region of the back portion being hingedly connected to a seat portion, the seat portion being supported on a pair of sliding guides mounted on the lower connecting portion of the U-shaped support member, and biassing means tending to oppose the movement of the seat portion with respect to the support member so that the position of the centre of gravity remains substantially constant during movement of the back and seat portions.

2. A chair as claimed in claim 1, wherein the sliding guides each comprise two members resting one upon the other, one of the guides being integral with a loadbearing portion of the seat and the other guide being integral with the U-shaped structural support member, the guide member integral with the loadbearing portion comprising an elongate prismatic body having a guide recess formed therein into which a projecting pin portion of the guide member integral with the U-shaped supporting member is inserted, the elongate prismatic member also having a longitudinal recess formed therein in which a spring is located, the pin acting against the spring when the seat portion is pushed forwardly on the guides.

3. A chair as claimed in claim 1 or 2 wherein the back portion of the chair projects above the connection of the support member to the arms of the chair, the projection portion being resilient and at least one resilient metal sheet being disposed between the lower loadbearing structure and the upper loadbearing structure of the back.

4. A chair as claimed in claim 1 constructed and arranged to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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